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| MCKENNA LONG & ALDRIDGE LLP 1900 K STREET, NW WASHINGTON, DC 20006 | | | KOCH, GEORGE R | |
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DATE MAILED: 12/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/661,472

Applicant(s)

LEE ET AL.

Examiner

George R. Koch III

Art Unit

1734

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-113 is/are pending in the application.
- 4a) Of the above claim(s) 34, 40, 64, 70, 87, 93, 100, 106 and 111-113 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-33, 35-39, 41-52, 64-69, 71-86, 88-92, 94-99, 101-105 and 107-110 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/11/2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I and species b and c in the reply filed on 9/27/2004 is acknowledged.
2. Claims 111-113 are withdrawn as being directed towards group II.
3. Claims 34, 64, 87 and 100 are withdrawn as being directed towards species "a".
4. Claims 40, 70, 93 and 106 are withdrawn as being directed towards species "d".
5. An action on claims 1-33, 35-39, 41-52, 64-69, 71-86, 88-92, 94-99, 101-105 and 107-110 follows.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
7. Claims 9-15, 21, 47 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
8. Claim 21 calls for a "second opening" in line 2. However, claim 21, and parent claims 19 and 1, do not recite a first opening. For the purposes of examination, only one opening has been considered.
9. Claim 47 recites the limitation "the transparent material" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim. Claim 47 depends from

Art Unit: 1734

claim 45, which does not recite any transparent material. It appears applicant has confused claim 45 with claim 46.

10. Claim 9 recites the limitation "the lower chamber plate" in line 4. There is insufficient antecedent basis for this limitation in the claim. Claim 9 depends from claim 1, which does not recite any chamber plates.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1, 18, 30 and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Satoshi (the JPO database machine translation of JP 2001-356353)

Satoshi discloses a substrate bonding device for fabricating a liquid crystal display (LCD) panel, comprising a base frame (stand 2 and frame 3), a lower chamber unit (bottom chamber 10) mounted to the base frame, wherein the lower chamber unit defines a lower interior space and includes an upper surface, an upper chamber unit (top chamber 21) arranged over the lower chamber unit, wherein the upper chamber unit defines an upper interior space, includes a lower surface, and is joinable to the lower chamber unit (described in paragraph 0033), chamber moving means for raising and lowering the upper chamber unit (the movement is described in paragraphs 0015 and the means are items 29 and 30), an upper stage (item 28) within the upper interior

space for securing a first substrate, a lower stage (item 9) within the lower interior space for securing a second substrate, alignment cameras (image recognition camera, and see paragraph 0037) provided to at least one of the upper and lower chamber units capable of and for verifying an alignment state of a plurality alignment marks formed on the first and second substrates, and alignment means (shown in Figure 2) arranged at side portions of the lower chamber unit for adjusting an alignment between the first and second substrates.

As to claim 18, Satoshi discloses that the chamber moving means includes a driving motor fixed to the base frame (item 40), a drive shaft (item 36) coupled to the drive motor, a connecting part connected to the driving shaft (item 37), a jack part (item 30) connected to the upper chamber unit and a connecting shaft (item 29) having one end connected to the upper chamber unit and the other end connected to receive a driving force from the driving shaft.

As to claim 30, Satoshi discloses sealing means (item 44) provided to at least one of the upper and lower surfaces for sealing an interior space surrounding the first and second substrates, wherein the sealed interior space is definable by joined ones of the upper and lower chamber units.

As to claim 31, Satoshi discloses that the sealing means includes an O-ring fitted along the upper surface (see paragraphs 0016-0017 and Figure 3).

13. Claims 98, 105, 107, and 109 are rejected under 35 U.S.C. 102(b) as being anticipated by Watanabe (US 2002/0043344).

Watanabe discloses a substrate bonding device for fabricating a LCD device, comprising an upper stage (item 59) for securing a first substrate of the LCD device, a lower stage (item 58) for securing a second substrate of the LCD device, first and second reels (items 54 and 55, and see paragraph 0040) arranged at opposite side portions of at least one of the upper and lower stages, a protection sheet (item 51) for covering a surface of at least one stage, wherein the protection sheet is scrollable by the first and second reels, and a rotating part (items 52 and 53) for rotating the first and second reels.

As to claim 105, Watanabe discloses that the first and second reels (items 54 and 55) are arranged elevationally lower than the surface of the lower stage (as shown in Figure 6).

As to claim 107, Watanabe discloses tension adjusting jigs (the combination of item 56 on one side, and 57 on the other) in the adjacent the first and second reels (items 54 and 55) which are capable of maintaining the protection sheet over the surface of the at least one stage to be substantially flat.

As to claim 108, the reels 54 and 55 allow the tension jigs to be rotatably mounted.

As to claim 109, Watanabe discloses the tension adjusting jigs 56 and 57 are movable in vertical directions (see paragraph 0040).

Art Unit: 1734

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

16. Claims 2-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoshi (the JPO database machine translation of JP 2001-356353) as applied to claim 1 above, and further in view of Miwa (US Patent 5,766,407)

Satoshi discloses all of the limitations of claim 1, and also discloses that the upper chamber unit includes an upper side exposed to an external environment and an inner rim portion analogous to an upper chamber plate attached to the lower surface at a periphery. However, Satoshi discloses one piece construction, and does not suggest the claimed two piece construction for these elements.

Miwa, though, discloses that multiple component bonding chambers are known (see, for exaple, Figure 3). One in the art would appreciate that multiple component chambers allow for smaller replacement parts which would reduce the downtime for maintenance. Therefore, it would have been obvious to one of ordinary skill in the art

Art Unit: 1734

at the time of the invention to have used multipiece construction for chamber elements in order to enable smaller replacement parts, thus reducing maintenance downtime.

As to claim 3, the portion of the upper chamber unit analogous to the upper chamber plate is shaped as a rectangular rim defining the upper interior space with the upper stage is arranged.

As to claim 4, Satoshi discloses that the upper stage is fixed to the portion analogous to the upper base.

As to claim 5, Satoshi discloses all of the limitations of claim 1, and also discloses that the lower chamber unit includes an lower side exposed to an external environment and an inner rim portion analogous to an lower chamber plate attached to the lower surface at a periphery. However, Satoshi discloses one piece construction, and does not suggest the claimed two piece construction for these elements.

Miwa, though, discloses that multiple component bonding chambers are known (see, for exaple, Figure 3). One in the art would appreciate that multiple component chambers allow for smaller replacement parts which would reduce the downtime for maintenance. Thererfore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used multipiece construction for chamber elements in order to enable smaller replacement parts, thus reducing maintenance downtime.

As to claim 6, the portion of the lower chamber unit analogous to the lower chamber plate is shaped as a rectangular rim defining the lower interior space with the lower stage is arranged.

Art Unit: 1734

As to claim 7, the lower chamber is considered capable of being moved as claimed.

As to claim 8, Satoshi discloses that the lower stage is fixed to the portion analogous to the lower base.

As to claims 9, Satoshi discloses the use shafts, actuators and contacting structures similar to cams (see Figures 2 and 3, especially items 82, 81, 60, 59, 58, 61 and 62) for adjusting chamber elements. However, Satoshi differs in that it varies the upper components, not the lower components. However, official notice is taken that it is well known and conventional to merely switch from adjusting upper to lower elements, and vice versa, as a matter of engineering design choice. Furthermore, one in the art would appreciate that such adjusting element would improve the positioning of the chamber elements, improving the apparatus functionality. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such components in the lower chamber in order to improve apparatus functionality.

As to claims 10-15, official notice is taken the mechanical arrangements of the alignment means claimed are well known and conventional. Satoshi does disclose some elements of the arrangements, such as step motors (item 62), connecting shafts (but not whether they are eccentrically connected), adjusting from opposite sides, and rectangular arrangements. One in the art would immediately recognize that all of these arrangements allow efficient movement of the chamber units, relative to each other. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the

Art Unit: 1734

invention to have utilized such components in the lower chamber in order to improve apparatus functionality.

17. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoshi (the JPO database machine translation of JP 2001-356353) as applied to claim 1 above.

Satoshi discloses all of the limitations of claim 1, but does not disclose interlocking means. However, official notice is taken that interlocking structures are well known and conventional as circa-19th century mechanical structures, especially such structures such as holes, shafts and linear actuators. Such interlocking means would ensure that components of the mechanical chamber unit are properly positioned relative to each other. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized interlocking means in order to achieve proper positioning between the elements of Satoshi.

18. Claims 19-21 and 45-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoshi (the JPO database machine translation of JP 2001-356353) as applied to claim 1 above, and further in view of Hiroki (US Patent 5,306,380)

Satoshi discloses all of the limitations of claim 1, but is silent as to a case surrounding the chamber units.

Hiroki discloses a case (Figure 1) surrounding the chamber units (items 3a, 3b, and 3c). One in the art would immediately recognize that the case provides a secure

Art Unit: 1734

and clean environment for performing the processes. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such a case in order to provide a clean and secure environment for the chambers.

As to claim 20, Hiroki discloses one inlet for loading the substrates (item 6).

As to claim 21, Hiroki discloses one "second" inlet for loading the substrates (item 6).

As to claim 45, Satoshi discloses the base frame, lower chamber unit, upper chamber unit, chamber moving means, upper stage, lower stage and sealing means (and see rejections of claims 1 and 30 above). Satoshi does not suggest a case surrounding the chamber units.

Hiroki discloses a case (Figure 1) surrounding the chamber units (items 3a, 3b, and 3c). One in the art would immediately recognize that the case provides a secure and clean environment for performing the processes. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such a case in order to provide a clean and secure environment for the chambers.

As to claims 46-48, official notice is taken that it is well known and conventional to make all or a part of the case (such as a window) out of a transparent material. One in the art would immediately recognize that such a transparency would permit for operator observance of the process operation, improving quality control. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to

Art Unit: 1734

have made all or a part of the case out of transparent material in order to provide operator quality control.

As to claim 49, Hiroki discloses one inlet for loading the substrates (item 6). Furthermore, as to claims 50 and 51 (and possibly claim 21), official notice is taken that it is well known and conventional to include multiple inlet/outlet openings and to position those openings as desired in order to connect the chamber with downstream and upstream LCD processing applications, thus improving efficiency. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such openings in order to connect with other LCD processing operations and improve efficiency.

19. Claims 22-29, 52-61, 75-84, are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoshi (the JPO database machine translation of JP 2001-356353) as applied to claim 1 above, or Satoshi and Hiroki as applied to claim 45 above, and further in view of Nakagomi (US Patent 5,742,173).

Satoshi discloses all of the limitations of claim 1, and Satoshi and Hiroki all of the limitations of claim 45, but do not suggest spraying means, blowing means, and flow tubes as claimed in claim 22 and 52.

Nakagomi discloses spraying means (i.e., the openings, see Figure 23), blowing means (the source) and connecting to gas supply sources (implying connecting tubes), in conjunction with ionizer equipment (see columns 16-17). One in the art would

Art Unit: 1734

immediately appreciate that such equipment improves the cleanliness of the chamber. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have included spraying means, blowing means, and flow tubes in order to ensure that the chamber is maintained at a sufficient cleanliness.

As to claim 75, Satoshi as applied to claim 1 above discloses a bonding device for fabricating LCD devices comprising the base frame, the lower chamber unit, the upper chamber unit, the chamber moving means, the upper stage, and lower stage as claimed (see the rejection of claim 1 above). Satoshi does not suggest spraying means, blowing means, and flow tubes as claimed in claim 75.

Nakagomi discloses spraying means (i.e., the openings, see Figure 23), blowing means (the source) and connecting to gas supply sources (implying connecting tubes), in conjunction with ionizer equipment (see columns 16-17). One in the art would immediately appreciate that such equipment improves the cleanliness of the chamber. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have included spraying means, blowing means, and flow tubes in order to ensure that the chamber is maintained at a sufficient cleanliness.

As to claims 23, 53, 76, Nakagomi as incorporated discloses a plurality of opens as claimed (see Figure 23, items 222a).

As to claims 24, 54, 77, Nakagomi as incorporated discloses the ionizers as claimed (column 16).

As to claims 25, 55, 78, Nakagomi as incorporated discloses needles (item 271), i.e., ion generating tips, in the claimed locations.

As to claims 26, 58, 81, Nakagomi as incorporated discloses that the ionizers are arranged proximate the units as claimed (see figure 23).

As to claims 27, 59, 82, Nakagomi as incorporated discloses the structure of the ionizers as in Figure 23 results in the ionizer being a flow tube arranged as side portions of the unit, with gas flowing out of the holes (item 272) and an ion generating tip proximate each of the holes (item 271)

As to claims 28, 60, 83, Nakagomi as incorporated suggests nitrogen gas (column 16, line 54). As to claims 29, 61, 84, the structures of Nakagomi are capable of removing foreign as claimed.

As to claims 56, 57, 79, 80, official notice is taken that it is well known and conventional to include outwardly sloped, curved regions in the chamber units. Such profiles would enable the chamber unit to be kept free of particles. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used outwardly sloped, curved, surfaces in order to keep the chamber units free of particles.

20. Claims 32, 33, 35-39, 41-44, 62, 63, 65-69, 71-74, 85, 86, 88-92, 94-97, 98- are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoshi (the JPO database machine translation of JP 2001-356353) as applied to claim 1 above, or Satoshi and

Art Unit: 1734

Hiroki as applied to claim 45 or 75 above, and further in view of Watanabe (2002/0043344).

Satoshi discloses all of the limitations of claims 1, and Satoshi and Hiroki make obvious the limitations of claim 45, and Satoshi and Nakagomi make obvious the limitations of claim 75, but does not disclose the first and second reels, protection sheet, and rotating part of claim 32, 62, 85.

As to claims 32, 62, 85, Watanabe discloses in the context of a a substrate bonding device for fabricating a LCD device, comprising an upper stage and lower stages for securing a LCD substrates, the concepts of the first and second reels (items 54 and 55, and see paragraph 0040) arranged at opposite side portions of at least one of the upper and lower stages, a protection sheet (item 51) for covering a surface of at least one stage, wherein the protection sheet is scrollable by the first and second reels, and a rotating part (items 52 and 53) for rotating the first and second reels. Watanabe discloses that the sheets enable transport of the substrates, and one would recognize that the sheets also provide protection from the plates. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such sheets, reels and rotating parts in order to transport the substrates.

As to claim 98, Satoshi as applied to claim 1 above discloses a bonding device comprising an upper stage and lower stage as claimed. However, Satoshi does not suggest the reels, the protection sheet, and the rotating part. Watanabe discloses in the context of a a substrate bonding device for fabricating a LCD device, comprising an

upper stage and lower stages for securing a LCD substrates, the concepts of the first and second reels (items 54 and 55, and see paragraph 0040) arranged at opposite side portions of at least one of the upper and lower stages, a protection sheet (item 51) for covering a surface of at least one stage, wherein the protection sheet is scrollable by the first and second reels, and a rotating part (items 52 and 53) for rotating the first and second reels. Watanabe discloses that the sheets enable transport of the substrates, and one would recognize that the sheets also provide protection from the plates. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such sheets, reels and rotating parts in order to transport the substrates.

As to claims 33, 63, 86, and 99, Satoshi discloses that the chuck is a combined pressure and electrostatic chuck (see paragraph 0020).

As to claims 35, 65, 88, and 101, Satoshi discloses a plurality of holes for transmitting a suction force.

As to claim 36, 66, 89, and 102, the electrostatic chuck of Satoshi, when combined with the sheet of Watanabe, is capable of being transmitted by the protection sheet.

As to claims 37, 38, 67, 68, 90, 91, 103 and 104 official notice is taken that it is well known and conventional to include holes in the protection sheet, and to correspond those holes with the holes of the electrostatic chuck. One in the art would appreciate that such holes would enable the chuck to hold the substrate, which is the function of

Art Unit: 1734

the chuck. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have corresponding holes in order to assure attraction of the substrate through the sheet.

As to claims 39, 69, 92, and 105 Watanabe discloses that the first and second reels (items 54 and 55) are arranged elevationally lower than the surface of the lower stage (as shown in Figure 6).

As to claims 41, 71, 94, and 107, Watanabe discloses tension adjusting jigs (the combination of item 56 on one side, and 57 on the other) in the adjacent the first and second reels (items 54 and 55) which are capable of maintaining the protection sheet over the surface of the at least one stage to be substantially flat.

As to claims 42 72, 95, and 108, the reels 54 and 55 allow the tension jigs to be rotatably mounted.

As to claim 43, 73, 96, and 109, Watanabe discloses the tension adjusting jigs 56 and 57 are movable in vertical directions (see paragraph 0040).


As to claim 44, 74, 97, and 110, Watanabe as incorporated does not suggest that the jigs are movable in lateral directions. However, official notice is taken that such movement would be well known and conventional. One in the art would appreciate that such movement would enable the sheet to be manipulated in order to cover the chamber unit more properly. Therefore, it would have been obvious to one of ordinary skill to have enabled the jigs to move in lateral directions in order to ensure that the sheet more properly.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George R. Koch III whose telephone number is (571) 272-1230 (TDD only). If the applicant cannot make a direct TDD-to-TDD call, the applicant can communicate by calling the Federal Relay Service at 1-866-377-8642 and giving the operator the above TDD number. The examiner can normally be reached on M-Th 10-7.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Fiorilla can be reached on (571) 272-1187. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


George R. Koch III
Patent Examiner
Art Unit 1734

GRK
12/08/2004